

Patient and Physician Perspectives Regarding Treatment of Diabetes: Compliance with Practice Guidelines

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BACKGROUND. Managed care organizations are focusing on how physicians manage their patients with diabetes mellitus as an indicator of physician compliance with clinical practice guidelines. Assessment of physician compliance with published guidelines may reveal areas of disagreement between physicians and guidelines or between physicians and patients and may show areas for potential improvement of care. Compliance with the diabetes care guidelines was assessed in our clinics to determine physician beliefs and performance and patients' accommodation of recommended practices.

METHODS. We interviewed 295 patients with diabetes and surveyed 47 providers at an academic family practice center to assess practices and beliefs regarding the care of patients with diabetes. We also reviewed a 1-year compilation of billing and referral records for physician use of glycosylated hemoglobin (hemoglobin A_{1c}) testing and referral of patients for eye examinations.

RESULTS. We found that physician beliefs and practices were divergent and that provider performance of these nationally recommended activities was low. More than 75% of providers said that they recommended hemoglobin A_{1c} testing, but only about 50% of patients had a documented test in the billing system. When questioned, one third of the patients reported that their physicians recommended this test. Similarly, nearly all physicians stated that they recommended annual eye examinations, although only 43% of patients said that their primary care physician recommended this referral.

CONCLUSIONS. Physicians can and must improve intervention and patient education in the care of diabetic patients. Patient knowledge, motivation, and practice must be augmented by physician efforts. Lack of compliance with guidelines may indicate deficiencies in physician knowledge, implementation problems, lack of belief in guidelines, or problems in patient compliance. Attention should be directed to all these areas.

KEY WORDS. Diabetes mellitus; hemoglobin A, glycosylated; practice guidelines. (*J Fam Pract* 1997; 44:369-373)

Diabetes mellitus is a chronic disease with large annual costs in terms of human suffering and fiscal resources. The management of diabetes mellitus is becoming a focus of improvement of care by advocacy groups and managed care organizations.^{1,2}

The Diabetes Control and Complications Trial reported that tight control of blood glucose levels can delay onset and slow progression of diabetic

complications for patients with type I diabetes.³ Intensive therapy has also been shown to be cost effective.^{4,5} The American Diabetes Association recommends glycosylated hemoglobin (hemoglobin A_{1c}) assessment at a minimum of twice annually as a measure of blood glucose control.⁶ Several organizations recommend annual eye examinations to check for retinopathy. Physician compliance with any of these recommendations is known to be poor.⁷ Among the reasons postulated for the lack of compliance is the longitudinal care required in a health care delivery system designed to deal with acute and episodic illnesses.⁸

We surveyed providers and interviewed patients with diabetes mellitus at an academic family prac-

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TABLE 1

Results of Attempts to Contact Diabetic Study Population at Family Medicine Center (N=595)

Results	Number
Interviews completed	295
No interview	301
Deceased	22
In nursing home	11
Declined to be interviewed	11
Denied having diabetes	5
Incorrect telephone number	107
No answer at listed telephone number	145

tice center to ascertain current beliefs and practices regarding recommendations on the management of diabetes. Specifically, we wanted to determine whether physicians practiced in accordance with the guidelines on use of eye examinations and hemoglobin A_{1c} testing, and what patients received and perceived in terms of these two practice guidelines.

METHODS

This study was conducted at an academic family medicine center with a clientele that has a large component of families and individuals who are indigent and of a lower socioeconomic status. Data were obtained from a variety of sources.

All health care providers at the department of family medicine were surveyed in the fourth quarter of 1995 to ascertain their knowledge and use of diabetes management tools. The survey instrument consisted of a 24-item questionnaire to assess the number of diabetic patients each provider cared for, the familiarity with and perceived use of guideline recommendations, and perceptions of patient compliance with diabetes care recommendations. The questionnaire was circulated after initial revision following pilot testing. All results are from physicians, as physician assistants were not assigned patients for longitudinal care.

Nearly 600 patients with diabetes (both type I and II, although more than 95% were type II) were identified from billing records from July 1, 1994, to June 30, 1995. A minimum of five separate attempts were made to contact these patients for a brief telephone interview regarding the care of their diabetes. The interview included questions about how the physician cared for each patient's diabetes. Questions

related to the two specific guidelines of interest, ie, the eye examination and the glycosylated hemoglobin test, were asked; several synonyms for glycosylated hemoglobin were mentioned, including hemoglobin A_{1c} and "a test for average blood sugar." Other questions asked about complications of the disease, long- and short-term goals of diabetes control, and who had the chief responsibility for controlling the disease. The final interview format was achieved after pilot testing on five patients. A 10% random sample of patient charts was reviewed to confirm patient interview responses regarding referral for eye examination and hemoglobin A_{1c} testing.

Billing data were used to perform analyses on actual physician activities. Items abstracted included age, sex, rendering physician, CPT codes, and diagnostic codes. A separate computerized referral record system was reviewed to determine whether diabetic patients were referred to an eye specialist.

Data were maintained on desktop computers and analyzed using the Statistical Analysis System for the Personal Computer (SAS Institute, Cary, NC). Inferential statistics included chi-square and *t* tests where appropriate.

RESULTS

Of the nearly 600 patients with diabetes identified by the billing records of the family medicine center, over one half could not be contacted by telephone (Table 1), despite repeated efforts. A total of 47 providers responded to the provider survey (85% response rate), including 14 physician faculty members, 28 resident physicians, 2 physician assistant faculty members, and 2 family medicine fellows. Eight resident physicians failed to respond to the survey, six of whom were first-year residents.

Demographics of the 295 patients who completed the interview are shown in Table 2. Those who completed the interview were different from those who did not. The mean age for those interviewed was 62.7 years, compared with 55.3 years for those not interviewed ($P=.0001$, *t* test). In addition, 77.7% of those interviewed were women, compared with 66.4% of those who could not be interviewed ($\chi^2 = 8.72$, $P=.003$). As a whole, the diabetic population interviewed tended to be older, African-American women.

Comparison between self-reported physician advice to patients on glucose testing and patient-

TABLE 2

Demographics of Diabetic Patients Who Completed Interviews in Study (n = 295)

Characteristic	Value
Age, y	
Mean (SD)	62.7 (14.8)
Median (range)	64.0 (23.0-95.8)
Sex, %	
Female	77.7
Male	22.3
Race/ethnicity, %	
White	33.8
African-American	58.4
Native American	4.4
Hispanic	1.4
Asian	0.3
Other	1.7

SD denotes standard deviation.

reported physician advice is noteworthy (Table 3). Nearly all providers recommend home glucose monitoring, but fewer than 75% of patients report that they actually perform it. Of those patients who do perform home glucose monitoring, less than one half check even once a day; nearly 35% check weekly or less frequently. More than three quarters of providers state that they recommend hemoglobin A_{1c} testing to their patients, but only one third of the patients confirm this recommendation. Over one half of patients think that this would be a useful test. From the billing records, annual use of the hemoglobin A_{1c} test for patients assigned to faculty members was 42.9%, and for patients of resident physicians use was 56.2%. Physicians who stated that they did not use the test said that they knew which patients were noncompliant (n = 7), and that they knew which patients checked their glucose at home (n = 3).

Similar discrepancies between physicians' and patients' expectations of care were noted for eye examinations of patients with diabetes (Table 4). More than 95% of providers stated that they recommend eye examinations to these patients. Only 43.4% of patients stated that their physicians ever sent them for

eye examinations, although 52.1% said that they had seen an eye specialist in the past year. Over three fourths of the patients noted that the frequency of eye examinations either was never stated by the primary care physician or was left to the patient and his or her provider of eye care. Review of the referral system showed that faculty members had a recorded annual eye examination referral rate of 16.5% for patients with diabetes. Residents had an annual referral rate of 9.8% of diabetic patients. Chart review of a 10% random sample of interviewed patients demonstrated over 70% concordance of patient report with chart documentation.

Patients were asked who they considered responsible for control of their diabetes, and physicians were asked how the patients would answer this question (Table 5). More than 60% of patients said they were solely responsible; altogether 80% assumed responsibility either alone or in partnership with their physician. Evidence of this statement is that while over one half of patients received eye examinations, only 16.5% of those eye examinations were due to physician referral.

TABLE 3

Study Physicians' Recommendations for Glucose Testing as Reported by the Physicians and Their Patients

Interview Items	As Reported by Physicians, %	As Reported by Patients, %
Physician recommends home glucose monitoring		
Yes	97.7	73.6
No	2.3	26.4
Physician recommends glycosylated hemoglobin tests		
Yes	77.8	33.1
No	22.2	66.9
Test frequency recommended by physician		
Monthly	—	0.8
Every 3 months	13.6	15.2
Every 6 months	36.4	9.3
Annually	20.5	4.3
Never	2.3	65.8
Other	27.3	4.7
Glycosylated hemoglobin is a useful test		
Yes	—	60.8
No	—	39.2

TABLE 4

Study Physicians' Recommendations for Eye Examinations as Reported by the Physician and Their Patients

Interview Items	As Reported by Physicians, %	As Reported by Patients, %
Eye examinations last year		
Yes	—	52.1
No	—	47.9
Physician referred patient to eye specialist		
Yes	95.5	43.4
No	4.5	56.6
Eye examination frequency recommended by physician		
Annually	93.0	17.6
Less often than annually	4.7	2.3
More often than annually	2.3	2.7
No recommendation; left to eye care provider	—	76.6
Eye examination frequency recommended by patient		
3-4 times per year	—	9.6
1-2 times per year	—	67.3
Every 2-3 years	—	6.0
Every 4-5 years	—	1.8
Do not know/other	—	13.2
Never	—	2.1

DISCUSSION

Although services providing tight control of blood glucose levels have been recommended in guidelines by national organizations, and tight control has been shown to be both beneficial and cost-effective, patients in this study did not receive the recommended services. Peterson and Smith⁹ note that diligent control of glucose levels is probably a gold standard, compared with actual community practice. Hiss⁸ notes that most community-based diabetic patients are not aggressively managed because of attitudinal, educational, and systemic factors that act as barriers to health care delivery. Lack of sufficient time for physicians to address all aspects of care may be a concern. Others have questioned the value of the practice guidelines.^{10,11}

Notwithstanding the reasons for lack of physician action, family physicians need to be proactive rather than reactive in disease management. Rather than simply searching for manifestations of disease, physicians need to be actively involved in prevention and control. Table 5 shows that approximately 80% of patients perceive themselves as solely or partially responsible for their diabetes care. To promote

excellent care, physicians need to solicit and foster this patient commitment.

One potential approach to diabetic care is a disease management approach.¹² This method uses a multi-disciplinary team of family physicians, subspecialists, pharmacists, nutritionists, social workers, and others to optimize patient health and to effect lifestyle changes, an area where physicians may have insufficient time and may be less comfortable and knowledgeable. This approach is becoming more common for chronic diseases with potential for high health care utilization, such as asthma. Ginsberg¹³ provides an outline for a disease state management program for diabetes. A recent review included this approach in recommendations for the care of diabetes in a managed care system.¹⁴ As a result of this study, our center has planned to implement a diabetes management program later this year, including pharmacologists, retinal screening, nutritionists, and certified diabetes educators.

As revealed by patient reports in this study, the physicians did not undertake diabetic management activities recommended by national organizations. The reasons for this lack of compliance with guidelines are not clear, but can be postulated to include lack of knowledge of the guidelines, lack of belief in the value of the guidelines, and, possibly, poor recall of physician advice by patients. The poor correlation between what physicians said they recommend and what was documented suggests that tracking procedures are inadequate or that physicians do not really believe in the utility of these

TABLE 5

Persons Identified in Study as Responsible for Diabetes Control

	Patient's Belief of Who Has Responsibility for Diabetes Care	
	As Perceived by Physician, %	As Reported by Patient, %
Patient	35.6	63.2
Physician	17.8	9.1
Patient and physician	40.0	15.8
Another person	4.4	6.7
Physician and other person	—	2.5
Patient and other person	—	1.1
All of above	—	1.8

activities and therefore do not actively promote their use. For instance, measurement of hemoglobin A_{1c} in a patient known to have chronically poor control may not be useful. Litzelman and Tierney¹⁵ suggest that in many instances noncompliance with guidelines may be appropriate, given physicians' knowledge and understanding of their patients.

Berg¹⁶ recommends critical review and a skeptical view of practice guidelines. Leape¹⁷ has noted the low compliance with "national" standards and has called for formation of a National Medical Standards Board. Although Leape prefers to increase compliance with standards, however untested or invalid, formation of a body similar to the US Preventive Services Task Force to rate potential interventions on their science and impact might be more appropriate. Saver¹⁸ suggests that guidelines need to be rigorously developed and flexible in implementation.

This study has several limitations. It was performed at one academic family practice center, which may not be representative of private physician practice or other geographic locations. The lack of availability of patients for completion of interviews is distressing, with only one half of identified patients interviewed. This limitation would likely impart a halo effect, if anything, to the study because those patients who are more accessible probably have better outcomes and are more adherent to recommendations than those who could not be contacted. In addition, numerous data sources (billing, surveys, interviews) were used and may have uncertain reliability; it is possible that the study revealed more about the billing and referral system inputs than provider activity. Patient charts were reviewed to determine whether physicians recommended interventions that were either declined by the patient or somehow not entered into the billing or referral system. We found a concordance rate of 70% or greater for both eye examination referral and hemoglobin A_{1c} testing, indicating that patient perceptions of their care were reasonably accurate. It is possible that patients self-referred without notifying the family physician. This lack of documentation would give an artificial low referral rate for eye examinations.

CONCLUSIONS

Patients did not consistently receive, and physicians did not ensure receipt of, nationally recommended

diabetes interventions. Proactive efforts to improve the care of diabetic patients through a variety of methods should be instituted. On a national level, care should be taken to ensure that guidelines are developed based on the best science available and that they truly foster improved health. Practice guidelines should be formulated to indicate and implement areas where physicians can make worthwhile improvements in care and outcome.

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